

## NEW AND INTERESTING TRICHOPTERA FROM THE WESTERN UNITED STATES

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Six new species of western United States Trichoptera are described: *Micrasema oregoni*, *Tinodes schusteri*, *Farula wigginsii*, *Hydropsyche andersoni*, *Hydropsyche dorata*, and *Lepidostoma roemhildi*. Several interesting diagnostic characters of *Amiocentrus aspilus* Ross, *Brachycentrus americanus* (Banks), *Brachycentrus occidentalis* (Banks) and *Pedomoecus sierra* Ross are given. Unless stated otherwise types will be deposited in the California Academy of Sciences, San Francisco.

### Hydropsychidae

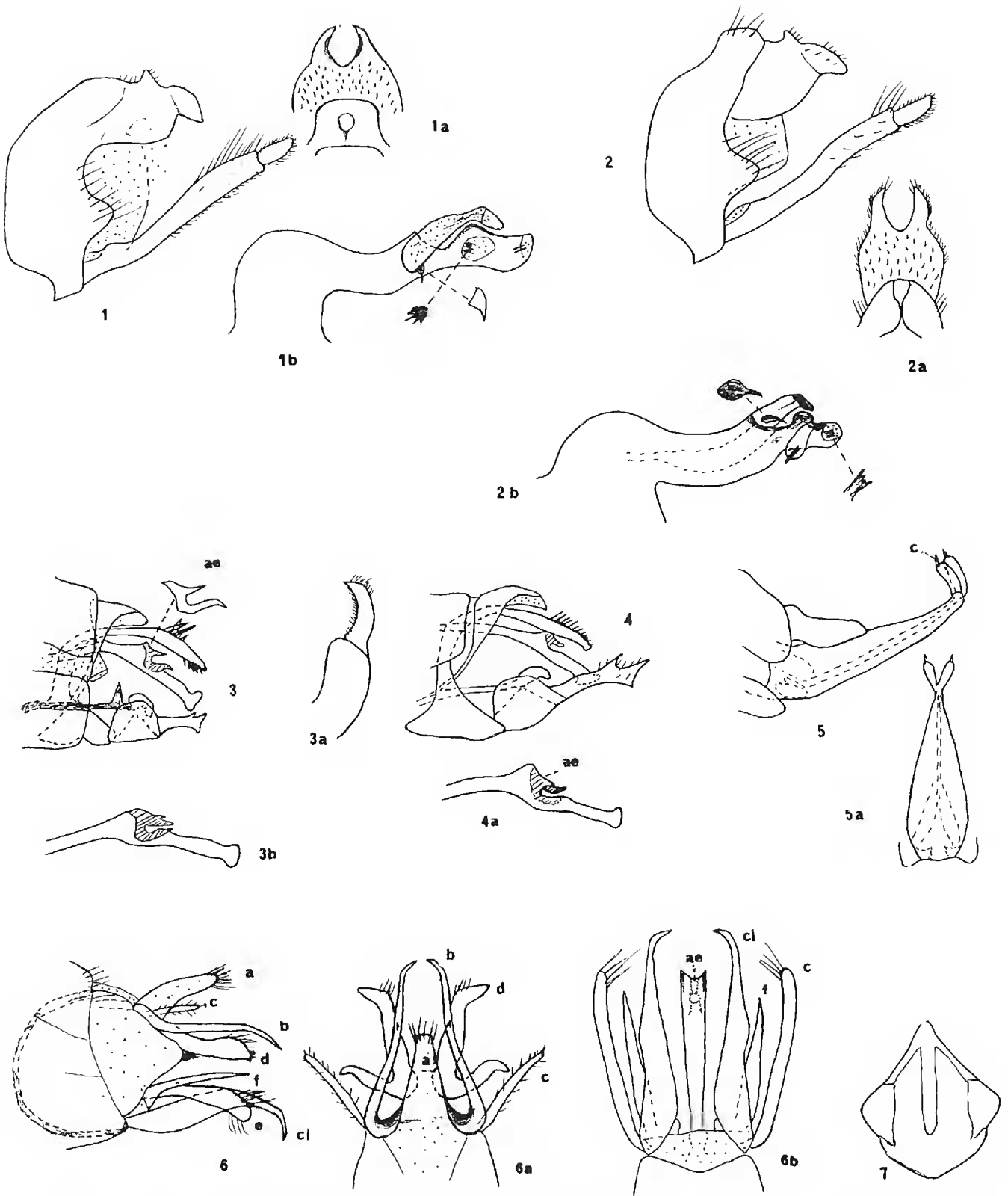
#### **Hydropsyche andersoni** Denning, new species

The species is a member of the *tana-abella* species group. Characteristics of the group are: crest-like profile of tergum 10, short membranous lateral endothelial processes of the phallic apparatus, contour of segment 9 and the translucent ovate area of dorsal tergum 9. It is closest to *H. vanaca* Denning.

*Male*.—Length 8.5 mm. Wings testaceous, head, thorax, appendages fuscous, spurs prominent. Genitalia (Fig. 1). Segment 9 lateral lobe ovate, demarcation of terga 9 and 10 indistinct. Tergum 9 translucent area outlined by dark brown Y-shaped margin. Tergum 10 triangular crest prominent, ventral margin arcuate, distolateral lobes wide, apex acute (Fig. 1); dorsal surface with dense short acute setae, apices convergent (Fig. 1a). Claspers (inferior appendages) distal segment short, obtuse. Phallic apparatus (Fig. 1b), typical of group, phallotheca sinuate, base large; endothelial processes directed ventrocephalad, distal spine fuscous and short, directed laterad from ventral aspect; phallotremal sclerite short, wide, fuscous, short internal sclerite directed cephalad; apex elongated, lateral ovoid area translucent, internal sclerite bears 5 acute dark spines directed laterad, non-pigmented area with dense spicules. Endophallus not discernible due to dark pigmentation.

*Holotype, male*.—OREGON: Lane County, H. J. Andrews Experimental Forest, Willamette National Forest, 25 June 1977, David Voegtlin. Paratype, male, same data as holotype, deposited in Entomology Department, Oregon State University, Corvallis. Holotype will be deposited in California Academy of Sciences.

This new species is named in honor of Dr. Norman H. Anderson, Oregon



Figs. 1-7. Fig. 1. *Hydropsyche andersoni*, male genitalia, lateral aspect; 1a, ninth and tenth tergites, dorsal aspect; 1b, phallic apparatus, lateral aspect. Fig. 2. *Hydropsyche dorata*, male genitalia, lateral aspect; 2a, ninth and tenth tergites, dorsal aspect; 2b, phallic apparatus, lateral aspect. Fig. 3. *Tinodes schusteri*, male genitalia, lateral aspect; 3a, clasper, ventral aspect; 3b, phallic apparatus, lateral aspect. Fig. 4. *Tinodes sigodana*, male genitalia, lateral aspect; 4a, phallic apparatus, lateral aspect, ae, aedeagus. Fig. 5. *Tinodes sigodana*, female genitalia, lateral view, c, cercus; 5a, ventral aspect. Fig. 6. *Farula wigginsi*, male genitalia, lateral aspect; 6a, dorsal aspect; 6b, ventral aspect. Fig. 7. *Farula wigginsi*, female genitalia, ventral aspect.

State University, who has made many noteworthy contributions to Trichopterozoology.

***Hydropsyche dorata* Denning, new species**

This species is a member of the *tana-abella* species group and is closely related to *H. tana* Ross.

*Male*.—Length 9 mm. Wings, appendages fulvous; head, thorax fuscous, setation sparse. Genitalia (Fig. 2). Segment 9 lateral lobes wide, apex obtuse; from dorsal aspect (Fig. 2a), apices convergent, dark brown margin, median translucent area subtriangular. Distal segment of clasper densely setose with whitish setae. Phallic apparatus (Fig. 2b), base stocky, bulbous; endothelial processes short, sessile except at apex, ventrolateral spur acuminate and capable of lateral movement; phallotremal sclerite fuscous, short, narrow, capable of only slight dorsoventral movement, apex bearing a membranous, ventrally directed process, sessile except apex; slender brown internal spine distally, apical ventral margin heavily pigmented; semicircular translucent area at apex with brown extrusible sclerite with row of acute spicules; endophallus narrowed abruptly near base.

*Holotype, male*.—OREGON: Marion County, Silver Falls State Park, Silver Creek, 23 June 1974, P. H. Arnaud, Jr. Paratype, male, same data as holotype.

Psychomyiidae

Genus *Tinodes* Stephens

The new species described herein is the twelfth North American species. These described species are known only from the western United States and Baja California, Mexico. *Tinodes provo* Ross and Merkley is widely distributed, being known from Baja California to Utah; the remaining species have an apparent limited distribution.

*Tinodes consuetus* McLachlan, 1871; California, Oregon.

*Tinodes belisa* Denning, 1950; Oregon, California.

*Tinodes parvula* Denning, 1950; California, Arizona.

*Tinodes provo* Ross and Merkley, 1950; Baja California, Utah, Nevada, California, Arizona.

*Tinodes sigodana* Ross, 1950; California.

*Tinodes siskiyou* Denning, 1951; Oregon, California.

*Tinodes cascadia* Denning, 1956; California, Oregon.

*Tinodes powelli* Denning, 1964; Baja California, Utah, California.

*Tinodes usilla* Denning, 1966; California.

*Tinodes gabriella* Denning, 1973; California.

*Tinodes twila* Denning, 1975; California.

*Tinodes schusteri* Denning, n. sp.; California.

***Tinodes schusteri* Denning, new species**

A member of the *siskiyou-sigodana* species group that is closely related to *Tinodes sigodana* Ross. The new species differs from *T. sigodana* in the shape of sternum 8, tergum 10, aedeagus, claspers and its mesal lobes. The contour of the phallic apparatus and the setal ornamentation of the intermediate appendages also differ from *T. sigodana*.

*Male*.—Length 4.5 mm. Wings fuscous, maxillary palpi slightly longer than forefemur. Genitalia (Fig. 3). Sternum 9 partially covers sternum 8; tergum 9 acute distally. Tergum 10 reduced and semi-membranous. Intermediate appendages with 3 large, 1 small acute spines; apex obtuse and densely setose; mesal surface concave. Phallic apparatus in repose may be placed between the intermediate appendages; aedeagus (shaded in Fig. 3, 3b) curved dorsad, apices acute. Clasper basal segment short, almost quadrate, dorsal margin convex, posterior mesal lobe narrow, erect, acute and large; second lobe coalesced to mesal surface of basal segment, semicircular, apex obtuse, curved ventrad; lobe is grooved and serves as a guide for phallic apparatus as suggested by Schmid (1980); apical segment short, linear, apex with a pair of short acute apices, lateral aspect (Fig. 3), convergent from ventral aspect (Fig. 3a).

*Holotype, male*.—CALIFORNIA: Canada del Puerto, Santa Cruz Island, Santa Barbara County, 20 June 1967, R. O. Schuster. Type deposited in the Department of Entomology, University of California, Davis. I take pleasure in naming this species in honor of the collector, Robert O. Schuster, who has collected many interesting Trichoptera.

*Tinodes sigodana* Ross

Due to the similarity of *T. schusteri* to *T. sigodana* figures of *T. sigodana* (Fig. 4) are presented for comparison to figures of *T. schusteri* (Fig. 3). In neither figures are the preanal appendages shown.

*Male*.—Discernible major differences of *T. sigodana* from *T. schusteri* are: heavier setation of intermediate appendages; longer basal segment of clasper, the absence of the acute dorsal lobe near basal segment and acute prominent apices of distal segment (Fig. 4). Phallic apparatus and aedeagus (Fig. 4a).

*Female*.—Genitalia (Fig. 5). Segment 8, terga 9, 10, 11 and cerci shown (Fig. 5, 5a). General similarity apparent to *T. provo* (Schmid, 1980), except the abrupt dorsal position of segment 11.

Male and female collected in Los Angeles County, California, Valley Forge, San Gabriel Mountains, 11 July 1970, J. A. Honey. Specimens loaned by Dr. Charles Hogue, Curator, Los Angeles County Museum of Natural History. Type locality of *T. sigodana* Ross is "San Gabriel Mountains, California, 29 June, L. J. Milne."

Limnephilidae  
Genus *Farula* Milne

Members of the genus are known from Washington, Oregon and California. The species are rare in collections with most known from only a few specimens. Exceptions are *F. malkini* and *F. honeyi* which have been collected in large numbers. Larvae of two species have been described: *F. malkini* and *F. jewetti*. The new species described herein is the eighth species in *Farula*.

*Farula rainieri* Milne, 1936; Oregon, Washington.

*Farula malkini* Ross, 1950; Oregon.

*Farula davisii* Denning, 1958; Oregon.

*Farula jewetti* Denning, 1958; Oregon.

*Farula reapii* Schmid, 1968; Oregon.

*Farula honeyi* Denning, 1973; California.

*Farula petersoni* Denning, 1973; California.

*Farula wigginsii* Denning, n. sp.; California.

In descriptions of all species except *F. reapii* Schmid, the various components of the highly specialized male genitalia are designated by a letter (a, b, etc.). Schmid (1980) recently named these morphological entities which is followed here, but to avoid confusion with described species the same lettering system initiated by Ross (1950b) is also used.

***Farula wigginsii* Denning, new species**

*Male*.—Length 6 mm. Maxillary, labial palpi similar in length, segments 1 and 2 practically identical in length. Spurs 2-4-4, foreleg spurs inconspicuous. Wings light brown. First antennal segment 4 times length of second. Pronotum with pair of opaque ovate areas, apical portion not pigmented. Genitalia (Fig. 6). Segment 8 caudal margin difficult to discern covering about half of segment 9. Margin of segment 9 heavily sclerotized, dark brown. Internal branch of tergum 10 (a) semi-membranous, light pigmentation, directed dorsocaudad; external branch (b) undulating in lateral aspect, acuminate, heavily sclerotized, dark brown; inferior branch (d) stout, heavily sclerotized, apex oblique and projecting caudad; preanal appendage (c) short, slender, non-pigmented; dorsal inferior branch (f) filamentous, directed caudad; lateral inferior branch (e) digitate, apex obtuse, curved caudoventral; ventral inferior branch (cl) abruptly narrowed distally, apex acute. From dorsal aspect (Fig. 6a), the fused internal branches of segment 10 distally narrowed (a), apex bearing whitish setae; preanal appendages (c) slender, directed laterally; external branch tergum 10 (b) base concave, acuminate and convergent; inferior branch tergum 10 (d) with basal branch directed slightly caudolaterad, apical branch bent laterad, structure fuscous, heavily

sclerotized. From ventral view (Fig. 6b), phallic apparatus (ae) lightly sclerotized, trough-like, apical margin concave, aedeagus faintly visible in cleared male.

*Female*.—Length 7 mm. Similar in coloration and general characteristics to male. Ventral aspect of segment 9 (Fig. 7).

*Holotype, male*.—CALIFORNIA: Marin County, Point Reyes National Seashore, 25 May 1975, D. G. Denning. Allotype, female, same data as male.

Named in honor of Dr. G. B. Wiggins, Royal Ontario Museum, Toronto, in recognition of his elucidation of the biology and immature stages of this complex genus.

### *Pedomoecus sierra* Ross

Although members of this monotypic genus are known from Alberta, British Columbia, Washington, Oregon and California, they are rare in collections. Due to apparent variability in details of the male genitalia (Fig. 8 is presented) differing somewhat from the figures by Ross (1947) and Schmid (1980). The phallic apparatus consists of a strongly sclerotized acute dorsal prong, paired processes of 3 acute sclerotized prongs and an internal black pigmented aedeagus near apex of the phallosome. The spine shown in Ross' (1947) figure at the base of the paired 3 branched structure is not present in males examined from Washington and Oregon. Male used in Figure 8 was collected at H. J. Andrews Experimental Forest, Willamette National Forest, Lane County, Oregon, 22 August 1977, by David Voegtlin.

### Brachycentridae

#### Genus *Micrasema* McLachlan

Currently there are 16 nearctic species in the genus but only five are from the western region: *M. bactro* Ross, *M. diteris* Ross, *M. onisca* Ross, *M. alexanderi* Denning, and *M. etra* Denning. There are probably several times that number of undescribed species from the Rocky Mountains to the Pacific Coastal regions.

Position and shape of lobes and contour of the mesodorsal margin of the claspers are diagnostic. Existing figures of described species do not account for variability which may be present. Figures should be shown from these aspects: lateral, mesal, dorsal and dorsomesal. To avoid confusion in descriptions, these mesodorsal lobes of the clasper should be marked 1, 2, 3 in figures.

#### *Micrasema oregoni* Denning, new species

A member of the *bactro* species group with the characteristic configuration of abdominal segments 6, 7, 8 and similar claspers, similar segment 9 and tergum 10.

*Male*.—Length 5.5 mm. General coloration fuscous. Tergo-pleural abdominal segments 6, 7, 8 enclosed by heavily pigmented margin, remainder opaque. Genitalia (Fig. 9). Segment 9 reduced dorsally to narrow strap. Preanal appendages trianguloid, base wide and separated on meson. Tergum 10 dorsal aspect (Fig. 9d), narrowed distally, margin bilobed; near base an elevated ridge with enlarged setose lobe discernible in dorsal or lateral view. Phallic apparatus (Fig. 9e) contains a blackish furcate structure. Clasper enlarged distally, mesodorsal margin subdivided into 3 lobes, lateral view (Fig. 9). Mesal aspect (Fig. 9a), lobe 1 broad, of uniform width; lobe 2 (center lobe) curved ventrally, acute, narrow; lobe 3 mesal surface appears as a heavily pigmented ridge. Dorsal aspect (Fig. 9b), lobe 1 wide, triangular; lobe 2 elongated, narrow, exceeds length of lobes 1, 3; lobe 3 twice length lobe 1, acute apex. Dorsomesal view (Fig. 9c), lobe 1 wide, arcuate; lobe 2 pear-shaped, apex acute; lobe 3 same width throughout, apex rotundate.

*Holotype, male*.—OREGON: Lane County, H. J. Andrews Experimental Forest, Willamette National Forest, Black Light Trap, 16 July 1977, David Voegtlin. Type deposited in Department of Entomology, Oregon State University, Corvallis.

#### *Amiocentrus aspilus* Ross

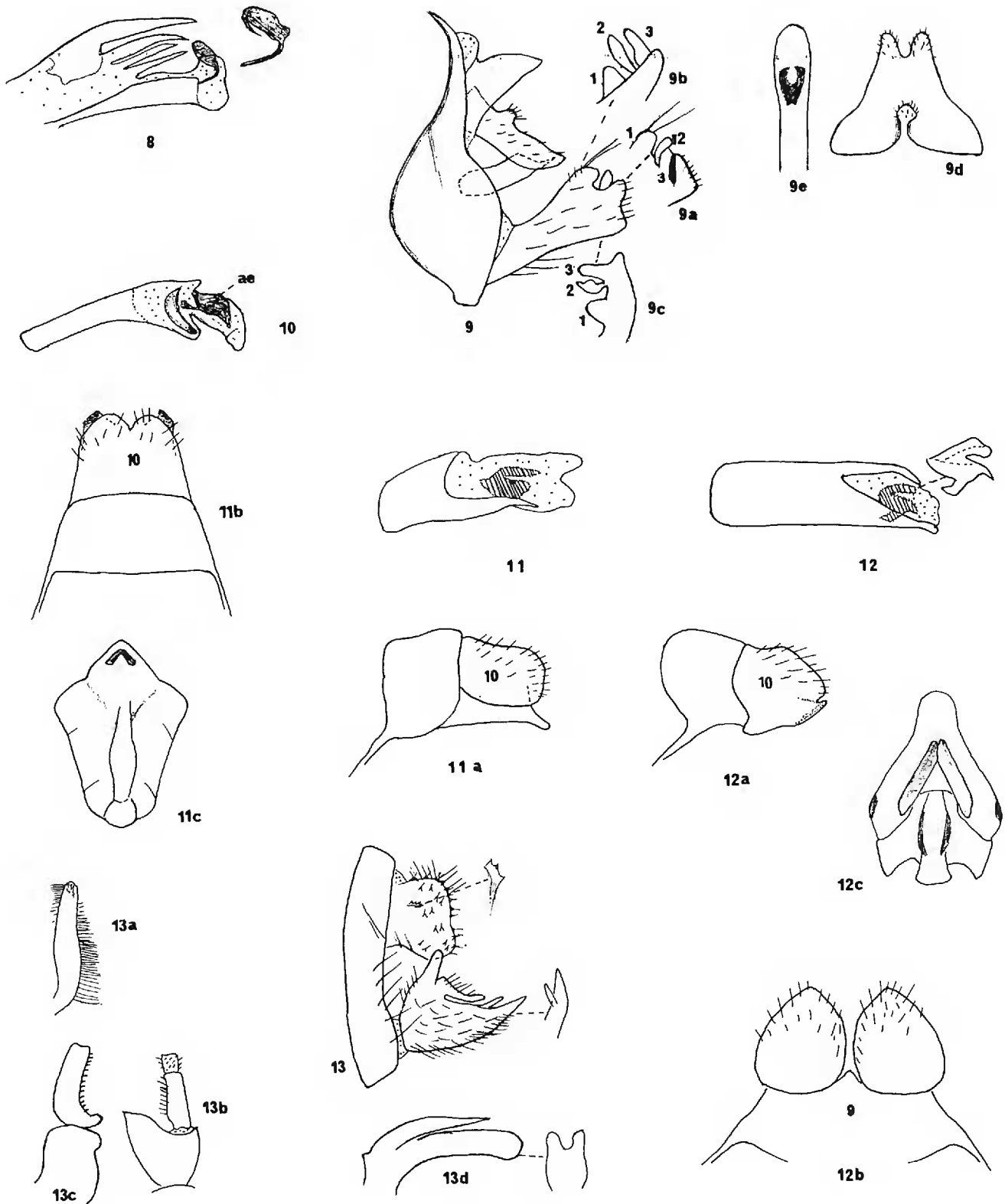
Widely distributed in British Columbia and western United States. The phallic apparatus (Fig. 10) in cleared males includes brown pigmented and opaque areas, a pair of brown internal sclerites, and the membranous faintly folded endotheca. Male from Oregon, Lane County, H. J. Andrews Experimental Forest, Willamette National Forest, 19 June 1977, David Voegtlin.

In collections received by the author males and females of *Brachycentrus americanus* and *B. occidentalis* are frequently misidentified. Therefore additional characters are given with figures pertinent to some of these characters.

#### *Brachycentrus americanus* (Banks)

*Male*.—Abdominal segments with no mesal lobes; 3–8 sterna fenestrate, seventh with row of dense brown setae along margin. Lateral margin of segment 9 with subacute lobe. Preanal appendages coalesced, V-shaped excision of distal margin. Tergum 10 divided into a pair of elongate lobes, a second pair of short branches arise dorsad. Phallic apparatus base dark brown, ventral margin continues dark pigmentation to near apex, remainder membranous; internal sclerite dark brown, dorsal branch subacute, ventral branch apex truncate (Fig. 11), furcate from ventral view.

*Female*.—Tergum 10 somewhat quadrangular in lateral aspect (Fig. 11a); dorsally mesal excision short, narrow, anovaginal plate appears coalesced



Figs. 8–13. Fig. 8. *Pedomoecus sierra*, phallic apparatus, lateral aspect. Fig. 9. *Micrasema oregoni* male genitalia, lateral view; 9a, clasper, mesal aspect; 9b, clasper, direct dorsal view; 9c, clasper, dorso-mesal aspect; 9d, tenth tergum, dorsal aspect; 9e, phallic apparatus, ventral view. Fig. 10. *Amiocentrus aspilus*, phallic apparatus, lateral view, ae, internal sclerite shaded. Fig. 11. *Brachycentrus americanus*, phallic apparatus, internal sclerite shaded; 11a, female genitalia, lateral view, tergites 9, 10; 11b, tergites 9, 10, dorsal aspect; 11c, bursa copulatrix, ventral view. Fig. 12. *Brachycentrus occidentalis*, phallic apparatus, lateral aspect, internal sclerite shaded; 12a, female genitalia, lateral view, tergites 9, 10; 12b, tergites 9, 10, dorsal view; 12c, bursa copulatrix, ventral view. Fig. 13. *Lepidostoma roemhildi*, male genitalia, lateral view; 13a, maxillary palpus, lateral view; 13b, antennal scape, first, second segments, lateral view; 13c, antennal scape, first, second segments, dorsal view; 13d, phallic apparatus, lateral, ventral view.



to tergum (Fig. 11b). Bursa copulatrix as in Figure 11c. Male, female from Box Elder County, Utah, One Mile Creek, 25 August 1978, R. W. Baumann.

*Brachycentrus occidentalis* (Banks)

*Male*.—Abdominal sternum 7 with large mesal lobe; the dark brown marginal emargination of sternum 5 similar in both species. Segment 9 without lateral lobe. Preanal appendages separated entire length. Tergum 10 entire, ventral surface concave, distal margin with narrow mesal excision; base with no dorsal branches. Base of phallic apparatus dark brown, dorsal and ventral margins dark brown to apex, membranous area small; internal sclerite brownish, apex of short dorsal branch ovoid, ventral branch apex acute, prominent ventral lobe present (Fig. 12).

*Female*.—Tergum 10 dorsal and ventral margins with irregular lateral aspect (Fig. 12a), distal margin with short excision; tergites widely separated in dorsal view (Fig. 12b). Male, female from Wallowa County, Oregon, Wallowa River, 19 May 1977, R. W. Baumann.

Lepidostomatidae

**Lepidostoma roemhildi** Denning, new species

This species is related to *L. spicata* Denning. Major differences from *L. spicata* and other described species are present in the maxillary palpi, claspers and phallic apparatus.

*Male*.—Length 9–10 mm. General color fulvous. Antennae carinate, segments with dark brown marginal setal band. A dense pocket of long, slender, black scale-like setae at base of forewings, wings without scales. Spurs 2-4-4. Maxillary palpi one-segmented, 3 times length of first antennal segment, appressed, slender, lightly pigmented, directed dorsad; mesal surface whitish, no scales; lateral surface with fuscous setae progressively shorter distally (Fig. 13a). Antennal scape lateral aspect (Fig. 13b), fuscous, massive, expanded dorsolaterally, thick whitish scales on mesal surface; first antennal segment twice length of second, base curved laterally, mesal surface concave with dense short black scales (Fig. 13c) dorsal view. Genitalia (Fig. 13). Tergum 10 confluent on meson, distal margin with rounded emargination laterally (Fig. 13); dorsal and ventral margins arcuate, lateral surface bearing minute tuberculate spinules. Clasper short, wide; baso-dorsal lobe digitate, lateral lobe elongate, parallel to densely setose main structure curved dorsad; a slender lobe present apically from concave mesal surface (Fig. 13). Phallic apparatus short, apex rotundate laterally, bilobed ventrally; short pair flat acuminate parameres closely appressed to phallosome (Fig. 13d).

This species is named in honor of the collector, Dr. George Roemhild, Montana State University, Bozeman, who has collected many interesting Trichoptera.

*Holotype, male.*—MONTANA: Sanders County, 10 miles NE Thompson Falls, West Fork Thompson River, 25 July 1975, George Roemhild. Paratype, male. Glacier County, Montana, Many Glacier Area, small seeps along Iceberg Lake Trail, 21 July 1979, R. W. Baumann, of Brigham Young University, Provo, Utah.

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